



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/855,972 | 05/15/2001 | Kevin P. Martin | 062002-1751 | 1603 |

7590 01/17/2003

Scott A. Horstemeyer
Thomas, Kayden, Horstemeyer & Risley, L.L.P.
Suite 1500
100 Galleria Parkway N.W.
Atlanta, GA 30339

EXAMINER

HASSANZADEH, PARVIZ

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1763

DATE MAILED: 01/17/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,972

Applicant(s)

MARTIN ET AL.

Examiner

Parviz Hassanzadeh

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-22 and 24-42 is/are pending in the application.
- 4a) Of the above claim(s) 20-22 and 27-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19,24-26 and 36-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Species 2 in Paper No. 4 is acknowledged. The traversal is on the ground(s) that claims 19 is fully generic on at least species 1 and 2. This is not found persuasive because as discussed in the Examiner interview in paper No. 5, claim 19 does not include the special features of species 2 and 3.

The requirement is still deemed proper and is therefore made FINAL.

Claims 20-22 and 27-35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species 1 and 3, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 4.

Terminal Disclaimer

The terminal disclaimer filed on 12/16/02 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Patent No. 6,033,587 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 112

Claims 19, 24-26 and 36-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is suggested to identify the electrical potential as either positive or negative voltage when referring to the bias potential applied to the substrate or the

Art Unit: 1763

potential of plasma. In claim 36, line 13, the term “electron ions” is vague as it is not clear whether it refers to “negatively charged ions” or merely “electrons”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19, 24-26 and 36-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaji et al (US Patent No. 5,290,993).

Kaji et al teach an apparatus (Fig. 1) for plasma etching a sample 14, the apparatus comprising:

a bell jar 3 and a vessel 4 defining a plasma generating and plasma processing space (*plasma reactor*), wherein the plasma is generated by a microwave generator 1 (having a plasma creation means); and

a sample table 10 (*mechanical support within the plasma reactor*), wherein the sample table 10 is coupled to an AC power source 16 and a DC power source 18 for applying a bias voltage on the sample table 10 (*the support is electrically connected to both a dc and an ac bias source*) (column 2, line 41 through column 3, line 41).

Regarding process limitation (responsive to electrically biasing the substrate to a first electrical potential, the substrate is electrically neutralized by positive ions of the plasma, and whereby responsive to electrically biasing the substrate to a second electrical potential, the

substrate is etched by electrons of the plasma): The apparatus is inherently capable of being operated under the condition cited in the claims, that is, electrically biasing to a first electrical potential to neutralize the substrate and to a second potential to etch the substrate by plasma electrons. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); “Apparatus claims cover what a device is, not what a device does” (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Claims 19, 24-26 and 36-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Okano et al (JP 56-81678-A)).

Okano et al teach an apparatus (Fig. 5) for plasma etching a material, the apparatus comprising:

a *plasma reactor* 36, wherein the plasma is generated by a high frequency power source 31 coupled to discharge electrodes 28, 29 (*having a plasma creation means*); and

an electrode 25 supporting a material 26 to be etched (*mechanical support within the plasma reactor*), wherein the material support electrode 25 is coupled to an AC power supply 33 and a DC power supply 35 for applying a superimposed bias current on the material support electrode 25 (*the support is electrically connected to both a dc and an ac bias source*) (abstract describing Fig. 3 having components similar to those shown in Fig. 5).

Regarding process limitation (responsive to electrically biasing the substrate to a first electrical potential, the substrate is electrically neutralized by positive ions of the plasma, and whereby responsive to electrically biasing the substrate to a second electrical potential, the substrate is etched by electrons of the plasma): The apparatus is inherently capable of being operated under the condition cited in the claims, that is, electrically biasing to a first electrical potential to neutralize the substrate and to a second potential to etch the substrate by plasma electrons. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); “Apparatus claims cover what a device is, not what a device does” (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

Art Unit: 1763

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19, 24-26 and 36-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorin (US Patent No. 4,464,223) in view of Kaji et al (US Patent No. 5,290,993).

Gorin teaches an apparatus (Fig. 2) for plasma etching a workpiece, the apparatus comprising:

a reactor defining a reaction volume 20 (*plasma reactor*), wherein the plasma is generated by a high frequency power source 30 coupled to a plasma generating electrode 12; and a workpiece support electrode 14 (*mechanical support*), wherein the workpiece support electrode 12 is coupled to an AC power supply 36 and a DC power supply 42 for applying a bias voltage on the workpiece support electrode 12 (*the support is electrically connected to both a dc and an ac bias source*) (column 2, line 7 through column 3, line 17).

Gorin fails to teach a the workpiece support being within the chamber.

Kaji et al teach an apparatus (Fig. 1) for plasma etching a sample 14 wherein a sample table 10 is disposed within the chamber (*mechanical support within the plasma reactor*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the sample table as taught by Kaji et al in the apparatus of Gorin as an art recognized equivalent means of supporting a substrate. See MPEP 2144.06, Art Recognized

Art Unit: 1763

Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (*in re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

Regarding process limitation (responsive to electrically biasing the substrate to a first electrical potential, the substrate is electrically neutralized by positive ions of the plasma, and whereby responsive to electrically biasing the substrate to a second electrical potential, the substrate is etched by electrons of the plasma): The apparatus is capable of being operated under the condition cited in the claims, that is, electrically biasing to a first electrical potential to neutralize the substrate and to a second potential to etch the substrate by plasma electrons. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); “Apparatus claims cover what a device is, not what a device does” (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Response to Arguments

Applicant's arguments filed 12/16/02 have been fully considered but they are not persuasive.

The Applicants assert that neither of the prior art of record (Kaji et al, Gorin, Okano et al, and Tamura et al) teach a substrate supported on a mechanical support being electrically biased

Art Unit: 1763

to a first electrical potential to neutralize the substrate and to a second potential to etch the substrate by plasma electrons.

The Examiner argues that the limitation of applying a first potential and a second potential are considered process limitations and the apparatus of prior art of record are inherently capable of being operated under the condition cited in the claims. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); “Apparatus claims cover what a device is, not what a device does” (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

The Applicants further assert that the power supply 36 of Gorin is used for creating plasma and the lower electrode of Gorin is not within the plasma reactor as recited in claim 19.

The Examiner argues that the plasma reactor of Goring includes another power source 30 for creating plasma and thus the power source 36 as well as 42 can be used for applying bias potential on the substrate holder. Further modification of the apparatus such that the substrate support to be disposed within the reactor is considered obvious, for example, in view of Kaji et al as an art recognized equivalent for the same purpose.

Art Unit: 1763

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tamura et al (US Patent No. 5,906,684) teach a plasma reactor including a substrate holding system coupled to both a DC power source 13 and an AC power source 12 (Fig. 10).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.



Parviz Hassanzadeh
Examiner
Art Unit 1763

January 14, 2003